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| 09/803,044 | 03/12/2001 | Rabah Boukherroub | 10963-US | 8419 |

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EXAMINER

CEPERLEY, MARY

| ART UNIT | PAPER NUMBER |
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1641

DATE MAILED: 12/16/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/803,044

Applicant(s)

BOUKHERROUB ET AL.

Examiner

Mary (Molly) E. Ceperley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37.CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1) The application referred to on page 5, line 4 of the specification must be identified by serial number.

2) In claim 21, third line from the end, the spelling of "hydroperoxide" should be corrected.

3) Applicant's election with traverse of Group II, in Paper No. 9 is acknowledged. The traversal is on the ground(s) that the search and examination of generic claim 1 would not be burdensome. This is not found persuasive because different searches are required in the technical literature for the reaction of an alkene and the reaction of an aldehyde. Additionally, different patentability considerations are involved for the use of each of the two reactants, the use of an aldehyde forming a Si-O bond and the use of an alkene forming a Si-C bond (see the discussion of paragraph **2)** of the September 20, 2002 Office action). A reference which would anticipate or render obvious the use of an alkene reactant would not necessarily render obvious the use of an aldehyde reactant.

The requirement is still deemed proper and is therefore made FINAL. It is noted that Group II should not have included claim 11 which is limited to the use of a non-elected aldehyde reactant. Therefore, claims 1-10 and 12-35 have been examined on the merits in this Office action to the extent that they encompass the use of the alkene reactant of Group II.

4) Although specific claims are cited in the rejections below, these rejections are also applicable to all other claims in which the noted problems/language occur.

5) The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6) The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7) Claims 1-10 and 12-35 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

a) The term "organic thermal processing" of claim 1 is not defined in the specification and this term does not appear to define a well known type of reaction. For an alkene reactant enablement appears to be limited to a reaction carried out at "a moderately elevated temperature (250°C), preferably 50°C-250°C, and more preferably 85°C-115°C" as described at page 3, lines 19-22 of the specification.

b) The specification does not provide an adequate enabling written description of the "reactants" defined "unsaturated group" and "nucleophilic centers". See also, paragraphs **8)c)** and **d)** below.

c) There is an inadequate enabling written description in the specification to support the use of any and all types of "reactant" as recited in claim 21. Enablement is limited to very specific reactants as being useful in the practice of the invention (see Scheme I of page 7).

8) Claims 1-10 and 12-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature

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introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitations "any unsaturated group...or nucleophilic center", and the claim also recites definitions in parentheses which are the narrower statement of the range/limitation.

b) In claim 1 it is unclear what is meant by the term "organic thermal processing". See also, paragraph **5)a)** above.

c) In claim 1, it is unclear what is meant by the term "any unsaturated group". This term includes, for example, a compound containing multiple fused benzene rings which would not appear to be appropriate for use in the formation of a "protective organic layer" on a porous silicon. Further, an "unsaturated **group**" (not a complete compound) cannot be a "reactant". The term " $RCH=X$ or $R^1R^2C=X$, $X=CH_2$ " is indefinite and incomplete in not defining the variables R, R^1 , and R^2 .

d) In claim 1, it is unclear what is meant by the term "nucleophilic center". Further, this term does not define a complete compound (a "reactant"). The term " RNu " is indefinite and incomplete in not defining the variables R and R' .

e) In claim 1, the term "the length of the carbon chains" finds no antecedent basis in the claim. The definitions of the "reactants" contains no reference to "carbon chains".

f) The term "octyl," in claim 6 does not define a complete "reactant". See also, claim 27 and the claim 27 term "ethylundecylenate, 1,7-octadiene".

g) In claim 12, it is unclear^w what is meant by the term "prior at said thermal processing step by distillation".

h) There is no antecedent basis for the term "structure" of claims 13 and 15.

i) In claim 21, there is no antecedent basis for the term "said hydrogen atoms".

j) In claim 21, it is unclear what is meant by the term "reactant",

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k) Claim 21 is confusing and indefinite in that it recites "providing a reactant" but does not require the actual **use** of this reactant to form "a protective organic layer".

9) Claims 34 and 35 are objected to as being duplicates of claims 1 and 20. The method of use limitations of claims 34 and 35 do not further distinguish the "structures" of claims 1 and 20 from those of claims 34 and 35.

10) The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11) Claims 1-10 and 12-35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5-7, 53 and 54 of copending Application No. 09/713,300. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method of reacting an Si-H porous silicon surface with an alkene and then further reacting the linker with a biomolecules as claimed in the 09/713,300 application is inclusive of the instantly claimed method, i.e. both applications have **as their inventive concept** the stabilization of an Si-H surface by reaction of the surface with an alkene. See in particular, claim 5 of 09/713,300 wherein "the covalent bond to the surface is formed in a thermal reaction".

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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12) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14) Claims 1-7, 15-18, 21, 23, 25, and 28-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Sieval et al (Langmuir (1998) 141759-1768).

Sieval et al describe the instantly claimed method of reacting a porous Si-H surface with a deoxygenated alkene reagent (e.g. 1-octadecene, 1-hexadecene, or 1-dodecene) while heating. This method anticipates the method of instant claims 1 and 21. See Figure 1; the paragraph bridging pages 1759 and 1760; page 1761: Layer Preparation, wherein "deoxygenated alkene" is reacted with Si-H at 200 °C for hours under a nitrogen atmosphere. The "deoxygenation" of the alkene reactant in the reference meets the limitation of instant claim 1 "wherein the reactants are purified to free them of peroxide and hydroperoxide impurities prior to said thermal processing". See page 8, lines 1-3 of the instant specification wherein the reactant is "deoxygenated neat 1-decene". The limitation wherein "the length of the carbon chains in the reactants is greater than or equal to 8" is met by the specific reagents used by Sieval et al (see 1-octadecene, 1-hexadecene, and 1-dodecene). The "electrochemical etching" of instant claim 21 is described by Sieval et al at page 1761, Layer preparation, wherein the silicon

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surface is treated with hydrofluoric acid. The product produced by the Sieval et al method anticipates the products of instant claims 28 and 29 which are produced by the same method.

15) Claims 8, 9, 10, 12-14, 19, 20, 22, 24, 26 and 27 are rejected under 35 USC 103 as being obvious over Sieval et al (Langmuir (1998) 141759-1768).

Sieval et al is applied for the reasons stated in paragraph **14)** above. The features of the dependent constitute obvious variation or optimization of parameters which are routinely modified in the art and which have not been described as critical to the practice of the invention. The following are examples of routine variation or optimization of process parameters: *i)* choice of a specific alkene, 1-decene, as recited in claim 9; note that "alkenes" are generically described by Sieval et al at page 1759, col. one, last three lines; *ii)* optimization of temperature range as in claim 8; *iii)* routine purification of reactants as in claim 12. It is considered to be well within the level of skill in the art and therefore obvious to optimize the reaction parameters of the Sieval et al process as defined in the instant dependent claims.

16) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary E. (Molly) Ceperley whose telephone number is (703) 308-4239. The examiner can normally be reached from 8 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le, can be reached at (703) 305-3399. The fax phone number for responses to be filed BEFORE final rejection is (703) 872-9306. The fax phone number for responses to be filed AFTER final rejection is (703) 872-9307.


Questions which are NOT RELATED TO THE EXAMINATION ON THE MERITS, should be directed to **TC 1600 CUSTOMER SERVICE at (703) 308-0198**. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

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December 12, 2002

A handwritten signature in cursive script, reading "Mary E. Ceperley".

Mary E. (Molly) Ceperley
Primary Examiner
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